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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 397,814	09.17.1999	ZHONG-CHENG HU	12610-0450	9259

23594 7590 01.29.2003

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EXAMINER

METZMAIER, DANIEL S

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 01/29/2003

25

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/397,814

Applicant(s)

HU, ZHONG-CHENG

Examiner

Daniel S. Metzmaier

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12-14, 16-32, 34-48, 50 and 51 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) 19, 20, 34-48, 50 and 51 is/are allowed.
- 6) ☐ Claim(s) 1-10, 12-14, 21-32 and 1618 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1-10, 12-14, 16-32, 34-48, 50-51 are pending in the instant application. The extension of time filed Nov. 19, 2002 has been entered as Paper No. 22. Claims 1, 19, 22, 34 and 43 have been amended; and claims 15 and 33 canceled by the amendment filed Nov 19, 2002, Paper No. 23. The Terminal Disclaimer filed Nov. 19, 2002 has been entered as Paper No. 24.

Terminal Disclaimer

1. The terminal disclaimer filed on Nov. 19, 2002 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 6,264,912 has been reviewed and is accepted. The terminal disclaimer has been recorded.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 7-10, 12-14, 16-18, 22-23, 25-29, and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Z.C. Hu et al., "Nucleation and growth for Synthesis of Nanometric Zirconia particles by Forced Hydrolysis", J. of Colloid and

Interface Science, 198:87-99 (1998)¹. M. Z.C. Hu et al (page 88, Materials and Method et seq) discloses methods of making nanoparticles by mixed solvent nucleation and growth of zirconia particles.

Hu et al differ from the claims in the temperature range for the hydrolysis or a single process employing the temperature and solvent to water ratios.

Hu et al (page 95) teaches the relationship between effective hydrolytic diameter and temperature for particular systems including a temperatures of 90° C for incubation. Specifically, the particle growth rate increases with increasing temperature.

Hu et al (pages 97 and 98, Figures 13 and 14) teaches a 1/1 volume ratio of organic solvent to water. Hu et al (page 98, Summary) recognizes the relationship between reaction rate and particle morphology including cubic versus spherical shape and microstructure including crystalline versus amorphous structure and rate adjusting factors including salt concentration, reaction temperature, and system additives including cosolvents that stimulate particle-particle coagulation.

The instant claims read on the 1/1 ratio and only differ from the 90° C disclosed in Hu et al by fractional amounts. Hu et al specifically teaches varying the reaction parameters for the advantage of particle production efficiency. It would have been obvious to one of ordinary skilled in the art at the time of applicants invention to vary the temperatures around those disclosed in the Hu et al reference by at least fractional

¹M.Z.C. Hu et al. was published in February 1998 in vol. 198, No. 1 of J. of Colloid and Interface Science and therefore has a publication date which qualifies its date as prior art under 35 USC 102(b).

amounts and/or vary the other rate adjusting factors including the addition of solvents and/or the concentrations of salts for the advantage of particle production efficiency.

3. Claims 4-6, 21, 24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over M. Z.C. Hu et al., "Nucleation and growth for Synthesis of Nanometric Zirconia particles by Forced Hydrolysis", J. of Colloid and Interface Science, 198:87-99 (1998), as applied to claims 1-3, 7-10, 12-18, 22-23, 25-29 and 31-32 above, and further in view of Y. T. Moon et al., "Preparation of Monodispersed and spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions", J. Am. Ceram. Soc., 78(10): 2690-2694 (1995).

Hu et al further differs from the claims in the further addition of a dispersant and the ratio of solvent to water.

Y.T. Moon discloses methods of making monodispersed ZrO_2 from zirconyl chloride solutions. Moon (page 1103) discloses 0.2M salt solution, R/H (alc/water vol. Ratio) ranges from 2 to 5. Figures 2 and 3 clearly show temperatures within applicants range of claims 13 and 14. Moon (micrographs, Fig 4-6) show nanosized particles. Moon (page 2693) discloses the dispersant is absorbed on the particles during particle growth. It is concluded the dispersant is added prior to or during incubation and would be absorbed at any time prior to the conclusion of particle growth, which would inhibit or stop particle growth and therefore incubation.

These references are combinable because they teach formation of nanosized particles and Moon is cited in Hu (15). It would have been obvious to one of ordinary skilled in the art at the time of applicants invention to add the dispersant after the

conclusion of the incubation since it inhibits of agglomeration and further growth of particles. Moon teaches the RH ratio as conventional in the art. Variation thereof would have been obvious to one having ordinary skill in the art at the time of the invention.

Allowable Subject Matter

4. Claims 19-20, 34-48 and 50-51 are allowed.
5. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not disclose or fairly suggest the sol-gel methods of making as claimed at room temperature having the parameters claimed.

Response to Arguments

6. Applicant's arguments filed Nov. 19, 2002 have been fully considered but they are not persuasive.
7. Applicant's amendment and response has obviated the rejection under 35 USC 112.
8. Applicant (page 7) asserts the Hu reference is directed to making particles rather than making sols or gels. Applicant asserts Hu does not teach making sols or gels. Applicant's remarks are confusing since sol and gel formation are discussed throughout the reference. See for example, paragraph bridging pages 89 and 90. See also paragraph bridging pages 95 and 96.

Furthermore, instant claim 43 forms particles and applicant's arguments appear inconsistent with said claims. The use of particles dispersed in sol form are conventional in the art in the form of pigment dispersed in systems and slip moldings

among others. The instant claims are silent regarding the formation of particles and do not exclude the formation of particles by the open language "comprising".

9. Applicant (page 8) asserts Moon does not remedy the alleged deficiencies of Hu since Moon is directed to particle formation. This has not been deemed persuasive for the reasons set forth above. Moon is relied on for the use of dispersants and the solvent ratios. Moon is clearly analogous art by the relationship of the products, starting materials and the solvents employed.

10. Applicant (page 8) asserts the compositions produced in the claimed processes may be used in coatings rather than in the formation of particles. This has not been deemed persuasive since the instant methods do not make this distinction. Furthermore, the intended use of a composition resulting from a claimed process is not probative for a process that may be used in an alternative use and is silent regarding any limitation to make said alleged distinction.

Conclusion

11. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

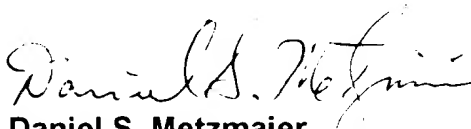
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (703) 308-0451. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on (703) 308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.


Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM
January 27, 2003